IN THE CLAIMS

Please amend the claims as follows:

1. (previously presented) An optical device, comprising:

multi-mode waveguides positioned on a base, the waveguides including input waveguides, transition waveguides, and an output waveguide,

the waveguides intersecting one another such that the transition waveguides carry light signals from the input waveguides to the output waveguide and combine the light signals onto the output waveguide,

at least a portion of the input waveguides including a contraction taper configured to contract the width of a light signal traveling along the input waveguide toward the output waveguide, wherein the contraction tapers do not taper vertically.

2. (canceled)

3. (previously presented) The device of claim 1, wherein at least a portion of the contraction tapers taper from an expanded end to a contracted end having a width less than 30 % of the width of the expanded end.

4. (previously presented) The device of claim 1, wherein at least a portion of the contraction tapers have a contracted end with width greater than 12 μm.

5. (previously presented) The device of claim 1, wherein at least a portion of the contraction tapers have a taper ratio in a range of than 8:1 to 200:1, the taper ratio being a ratio of the taper length:the taper width.

6. (previously presented) The device of claim 1, wherein at least one output waveguide includes an expansion taper configured to expand a light signal traveling along the output waveguide away from the input wavguides.

7. (previously presented) The device of claim 6, wherein the expansion tapers do not taper vertically.

8. (previously presented) The device of claim 6, wherein the expansion tapers expand from a contracted end to an expanded end, the contracted end having a width less than 80 % of the width of the expanded end.

9. (previously presented) The device of claim 6, wherein at least a portion of the expansion tapers have a taper ratio in a range of 8:1 to 200:1, the taper ratio being a ratio of the taper length:the taper width.

10. (previously presented) The device of claim 1, wherein one or more of the waveguide intersections is constructed such that a waveguide configured to carry output from the intersection has a width greater than a width of each waveguide configured to carry input to the intersection.

11. (previously presented) The device of claim 1, wherein the waveguides have lateral sides that extend down to the base.

12. (canceled)

13. (previously presented) The device of claim 1, wherein one or more of the waveguides end at a facet that is substantially vertical relative to a base, each facet being angled at less than ninety degrees relative to a direction of propagation of a light signal traveling along the waveguide at the facet.

14. (previously presented) The device of claim 1, further comprising:

one or more inactive regions spaced apart from the waveguides so as to define waveguide trenches adjacent to the waveguides.

15. (previously presented) The device of claim 1, wherein the waveguides have a thickness between 16 μm and 75 μm and a width between 16 μm and 75 μm.

16. (previously presented) The device of claim 1, wherein each waveguide has a width that is more than 1.4 times a width of the waveguide.

17. (previously presented) The device of claim 1, further comprising:

a plurality of light sources for generating light signals, each light source being positioned in a recess on the base such that a light signal generated by the light source enters an input waveguide.

18. (previously presented) An optical device, comprising:

multi-mode waveguides positioned on a base, the waveguides including input waveguides, transition waveguides, and an output waveguide,

the waveguides intersecting one another such that the transition waveguides carry light signals from the input waveguides to the output waveguide and combine the light signals onto the output waveguide,

the output waveguide including an expansion taper configured to expand the width of a light signal traveling along the output waveguide after having traveled through an input waveguide,

wherein the expansion tapers do not taper vertically.

19. (canceled)

20. (previously presented) The device of claim 18, wherein at least a portion of the expansion tapers taper from an expanded end to a contracted end having a width less than 30 % of the width of the expanded end.

21. (previously presented) The device of claim 18, wherein at least a portion of the expansion tapers have a contracted end with width greater than 10 μm.

22. (previously presented) The device of claim 18, wherein at least a portion of the expansion tapers have a taper ratio in a range of than 8:1 to 200:1, the taper ratio being a ratio of the taper length: the taper width.

23.-34. (canceled)

35. (previously presented) The device of claim 1, wherein the waveguides are immobilized along their length relative to the base.

36. (previously presented) The device of claim 18, wherein the waveguides are immobilized along their length relative to the base.

37. (previously presented) An optical device, comprising:

multi-mode waveguides positioned on a base, the waveguides including input waveguides, transition waveguides, and an output waveguide,

the waveguides intersecting one another such that the transition waveguides carry light signals from the input waveguides to the output waveguide and combine the light signals onto the output waveguide,

at least a portion of the input waveguides including a contraction taper configured to contract the width of a light signal traveling along the input waveguide toward the output waveguide, and

wherein one or more of the waveguides end at a facet that is substantially vertical relative to a base, each facet being angled at less than ninety degrees relative to a direction of propagation of a light signal traveling along the waveguide at the facet.

38. (previously presented) The device of claim 37, wherein at least a portion of the facets that are angled at less than ninety degrees relative to the direction of propagation are positioned at the end of a contraction taper.

39. (previously presented) The device of claim 37, wherein at least a portion of the contraction tapers taper from an expanded end to a contracted end having a width less than 30 % of the width of the expanded end.

40. (previously presented) The device of claim 37, wherein at least a portion of the contraction tapers have a contracted end with width greater than 12 μm.

41. (previously presented) The device of claim 37, wherein at least a portion of the contraction tapers have a taper ratio in a range of than 8:1 to 200:1, the taper ratio being a ratio of the taper length:the taper width.

42. (previously presented) The device of claim 37, wherein at least one output waveguide includes an expansion taper configured to expand a light signal traveling along the output waveguide.

43. (previously presented) The device of claim 42, wherein the expansion tapers expand from a contracted end to an expanded end, the contracted end having a width less than 80 % of the width of the expanded end.

44. (previously presented) The device of claim 42, wherein at least a portion of the expansion tapers have a taper ratio in a range of 8:1 to 200:1, the taper ratio being a ratio of the taper length:the taper width.

45. (previously presented) The device of claim 37, wherein one or more of the waveguide intersections is constructed such that a waveguide configured to carry output from the intersection has a width greater than a width of each waveguide configured to carry input to the intersection.

46. (previously presented) The device of claim 37, wherein lateral sides of the waveguides extend down to the base.

47. (canceled)

48. (previously presented) The device of claim 37, further comprising:

one or more inactive regions spaced apart from the waveguides so as to define waveguide trenches adjacent to the waveguides.

49. (previously presented) The device of claim 37, wherein the waveguides have a thickness between 16 μm and 75 μm and a width between 16 μm and 75 μm.

50. (previously presented) The device of claim 37, wherein each waveguide has a thickness that is more than 1.4 times a width of the waveguide.

51. (previously presented) The device of claim 37, further comprising:

a plurality of light sources for generating light signals, each light source being positioned in a recess on the base such that a light signal generated by the light source enters an input waveguide.

52. (previously presented) The device of claim 37, wherein the waveguides are immobilized along their length relative to the base.

53. (previously presented) An optical device, comprising:

multi-mode waveguides positioned on a base, the waveguides including input waveguides, transition waveguides, and an output waveguide,

the waveguides intersecting one another such that the transition waveguides carry light signals from the input waveguides to the output waveguide and combine the light signals onto the output waveguide,

the output waveguide including an expansion taper configured to expand the width of a light signal traveling along the output waveguide after having traveled through an input waveguide, and

wherein one or more of the waveguides end at a facet that is substantially vertical relative to a base, each facet being angled at less than ninety degrees relative to a direction of propagation of a light signal traveling along the waveguide at the facet.

54. (previously presented) The device of claim 53, wherein at least a portion of the facets that are angled at less than ninety degrees relative to the direction of propagation are positioned at the end of an expansion taper.

55. (previously presented) The device of claim 53, wherein at least a portion of the expansion tapers taper from an expanded end to a contracted end having a width less than 30 % of the width of the expanded end.

56. (previously presented) The device of claim 53, wherein at least a portion of the expansion tapers have a contracted end with width greater than 10 μm.

57. (previously presented) The device of claim 53, wherein at least a portion of the expansion tapers have a taper ratio in a range of than 8:1 to 200:1, the taper ratio being a ratio of the taper length: the taper width.

58. (previously presented) The device of claim 53, wherein the waveguides are immobilized along their length relative to the base.

59. (canceled)

60. (previously presented) An optical device, comprising:

multi-mode waveguides positioned on a base, the waveguides including input waveguides, transition waveguides, and an output waveguide,

the waveguides intersecting one another such that the transition waveguides carry light signals from the input waveguides to the output waveguide and combine the light signals onto the output waveguide,

at least a portion of the input waveguides including a contraction taper configured to contract the width of a light signal traveling along the input waveguide toward the output waveguide,

and wherein each waveguide has a thickness that is more than 1.4 times a width of the waveguide.

61. (previously presented) The device of claim 60, wherein the waveguides are immobilized along their length relative to the base.

62. (previously presented) An optical device, comprising:

multi-mode waveguides positioned on a base, the waveguides including input waveguides, transition waveguides, and an output waveguide,

the waveguides intersecting one another such that the transition waveguides carry light signals from the input waveguides to the output waveguide and combine the light signals onto the output waveguide,

the output waveguide including an expansion taper configured to expand the width of a light signal traveling along the output waveguide after having traveled through an input waveguide, and

wherein each waveguide has a thickness that is more than 1.4 times a width of the waveguide.

63. (previously presented) The device of claim 62, wherein the waveguides are immobilized along their length relative to the base.

64. (previously presented) The device of claim 1, wherein the waveguides intersect one another in accordance with Y-type intersections where a light signal carrying region in one of the intersecting waveguides goes through a continuous and unbroken transition into a light signal carrying region in each of the other intersecting waveguides.

65. (previously presented) The device of claim 64, wherein the waveguides include at least four input waveguides.

66. (previously presented) The device of claim 1, wherein a pair of the input waveguides intersect at one of the transition waveguides such that the light signals traveling along the pair of input waveguides are transferred from the input waveguides to the transition waveguide intersected by the pair of input waveguides.

67. (previously presented) The device of claim 1, wherein each input waveguide that includes a contraction taper terminates at a transition waveguide and excludes an expansion taper between the contraction taper and the transition waveguide at which the input waveguide terminates.

68. (previously presented) The device of claim 1, wherein input waveguides that include a contraction taper also include a portion that is not-tapered.

69. (previously presented) The device of claim 68, wherein the non-tapered portion is between the contraction taper and one of the transition waveguides.

70. (previously presented) The device of claim 1, wherein the contraction tapers are positioned along a length of the input waveguides and are not included in an intersection of the waveguides.